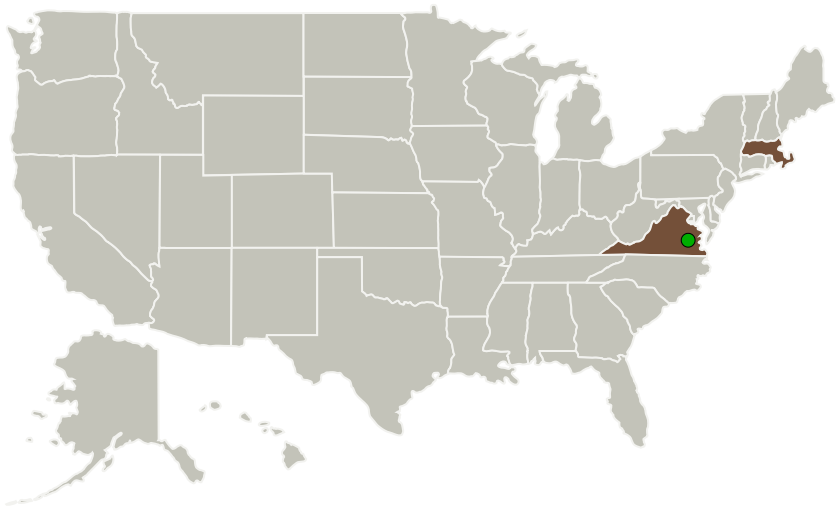
Low-Cost Lidar for Wake-Vortex and Other Hazard Detection, Phase II

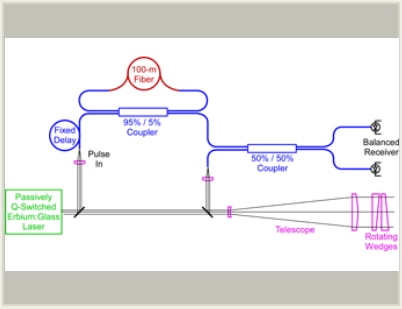
Completed Technology Project (2013 - 2016)

Project Introduction

The evolution of the National Airspace System via the Next Generation Air Transportation System program depends on enabling new operational concepts to increase efficiency. Decreasing the spacing between aircraft on takeoff and landing would increase the throughput of airports. On-board sensing capability for wake vortices could allow aircraft to operate with reduced spacings. Wake vortices can be detected by a lidar located on the aircraft, but such a system needs to be small, lightweight, rugged, and require minimal maintenance. The Phase I program showed the feasibility of an intrinsically low-cost, coherent lidar that would be suitable for deployment on commercial airliners for axial wake vortex detection. The Low-Cost Lidar Test Bed was used to demonstrate measurement of aerosol returns. The program also assessed the feasibility of using the lidar for remote detection of clear air turbulence and volcanic ash clouds. The program developed a conceptual design for a prototype system that would be fabricated and ground tested in the Phase II program. The Phase II program will design and fabricate an engineering prototype compact coherent Doppler lidar and demonstrate it by measuring ambient wind fields at nearby venues.

Primary U.S. Work Locations and Key Partners





Low-Cost Lidar for Wake-Vortex and Other Hazard Detection Project Image

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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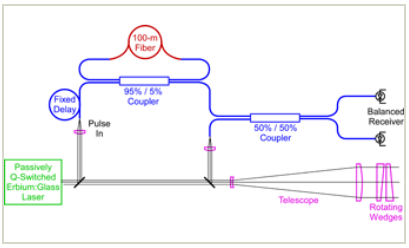
Organizations Performing Work	Role	Type	Location
Q-Peak, Inc.	Lead Organization	Industry	Bedford, Massachusetts
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Massachusetts	Virginia

Images



Project Image
Low-Cost Lidar for Wake-Vortex and Other Hazard Detection Project Image
(https://techport.nasa.gov/image/135387)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Q-Peak, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

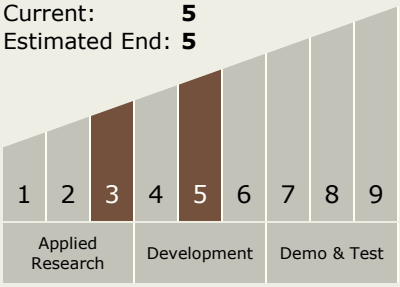
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Chris H Depriest

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System